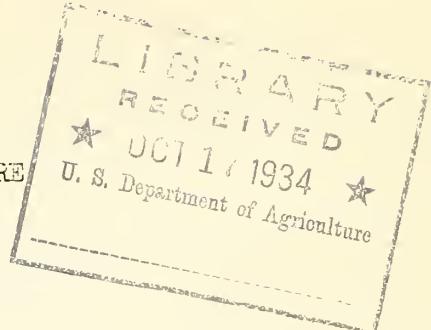


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UNITED STATES DEPARTMENT OF AGRICULTURE
WEATHER BUREAU
WASHINGTON



Office of the Chief

October 16, 1934.

CIRCULAR

INSTRUCTIONS FOR MAKING OFF-AIRWAYS REPORTS
AND FOR ADDING SPECIAL DATA TO RADIO
AND TELETYPE SEQUENCE REPORTS

- I. Purpose and Scope of Circular.
- II. Filing of Reports.
- III. Preparation of Reports Sent by Telegraph or as a Special Message by Radio.
- IV. Instructions for Adding Special Data to Radio and Teletype Sequence Reports.



CIRCULAR

INSTRUCTIONS FOR MAKING OFF-AIRWAYS SPECIAL REPORTS
AND FOR ADDING SPECIAL DATA TO RADIO AND
TELETYPE SEQUENCE REPORTS

SECTION I.

Purpose and Scope of Circular.

1. Beginning October 21, 1934, the following instructions will supersede those given in the Circular "Instructions for Making Four-Hourly Reports", dated July 15, 1933, and later supplements or additions thereto, and those in the Circular "Transmission of Pressure-Change Data in 4-Hourly Airways Weather Reports and the Transmission of 4-Hourly 'Pressures Reduced to the 5000-foot Plane' by Selected Stations in the Western Plateau Region," dated August 1, 1934, and those Circulars are hereby revoked.

2. The instructions regarding the preparation and transmission of data contained in this Circular are divided into two parts, one applying to reports by special message by telegraph or radio using code, the other to special data to be added to radio or teletype sequence reports without using code. Officials are requested to read the Circular carefully so that the system applying to their station is understood without confusion.

3. Observations made in accordance with the following instructions are to be prepared with the same standard of accuracy as that required in all Weather Bureau work. Only stations heretofore or hereafter specifically authorized by letter from the Central Office will forward reports by telegraph.

4. Copies of this Circular are being furnished direct to all first-order and airport stations, and a sufficient number of extra copies will be furnished all general supervising stations to permit its distribution to all Weather Bureau airways stations manned by Weather Bureau noncommissioned personnel on the airways under their supervision. Copies are being furnished to the Department of Commerce and to the War and Navy Departments for distribution to their personnel and stations.

SECTION II.

Filing of Reports.

5. (a). Reports sent by telegraph, or telephone and telegraph, will be filed about 20 minutes preceding the hours of 4 and 8 a. m. and

p. m., and 12 Noon and 12 Midnight, daily, Eastern Standard Time, except in cases where specific authority for varying this time has been issued, and except that stations rendering regular signal reports and telegraphing or/and telephoning four-hourly reports will not send a report at 8 a. m. and p. m. unless they have been specifically authorized to do so.

(b). Reports sent as a special message by radio will be filed at each of the periods enumerated in "a" above.

(c). In reports sent as a part of a teletype or radio sequence, the special data required will be added to those reports transmitted nearest the hours specified in "a" above.

SECTION III.

Preparation of Reports Sent by Telegraph or as a Special Message by Radio

6. The following "order of elements" will be used:

- (a). Ceiling (uncoded) (paragraph 7)
- (b). Sky (uncoded) (paragraph 7)
- (c). Visibility (uncoded) (paragraph 7)
- (d). Weather (uncoded) (paragraph 7)
- (e). Obstructions to Vision (uncoded) (paragraph 7)
- (f). Temperature and Dew Point (coded) (paragraphs 8-10)
- (g). Wind (direction and velocity, coded)
Character (uncoded) (paragraphs 11-12)
- (h). Barometric pressure, sea level (coded) (paragraph 13)
- (i). Remarks (uncoded) (paragraph 14)
- (j). Pressure Change and Characteristic, including
5000-foot pressure at designated stations
(coded) (paragraphs 15-20)
- (k). Clouds (coded) (paragraphs 21-24)
- (l). Thunderstorms not included under "Weather"
(coded) (paragraph 25)
- (m). Depth of Snow, at 8 a. m., E. S. T. (coded)
(paragraph 26)

Note: - If for any reason any element or data for enciphering an entire code word are missing, the word "missing" will be sent in its place.

Note: - Reports transmitted by telegraph and then relayed by teletype or radio will be placed in the form of sequence reports before being so transmitted, the pressure change, cloud and thunderstorm data being added in the form prescribed in Section IV. The height of scattered clouds telegraphed in accordance with Paragraph 23(f) of this Circular will be placed under "Remarks" in the relayed reports, the average value of the interval indicated by the code word being given, i.e., "One" would be sent 200, "Three" as 1500, etc. The amount, kind and direction of the clouds would be transmitted in the special cloud data added to the report in accordance with instructions in Section IV.

7. CEILING; SKY; VISIBILITY; WEATHER; OBSTRUCTIONS TO VISION:- These elements will be reported in accordance with the terms and instructions contained in Paragraphs 1, 2, 3, 4, and 5, respectively, of Form 1133-Aer., August 1, 1934, or in future revisions thereof or of Circular N, except that the word "clouds" will not be sent in "Sky" reports and that the reporting of low scattered clouds will not be made under "Remarks". In this latter connection, see paragraphs 14 and 23(f).

8. TEMPERATURE AND DEW POINT:- These data will be reported by use of the regular barometer/temperature code words on pages 19-28, inclusive, of the 1931 Weather Code, the first element of the words to represent the temperature and the second the dew point. Thus "DEBOUCH" would indicate a temperature of 24 degrees and a dew point of 18 degrees. Stations reporting temperature only, will do so by adding "LUB" to the words for zero or 100-degree temperature, except in case the words ends in "L" when "UB" will be added. This method will also be used at stations which regularly report dew point, but which for any reason, such as breakage of thermometers, etc., are temporarily unable to do so. Thus, "DAMPLUB" would indicate a temperature of 22 degrees and the dew point not sent.

9. The values of the temperature and dew point will be coded in accordance with the regular Weather Bureau rule for dropping decimals or figures to meet the limitations of the code, i. e., if the value was 47.0 it would be coded as 46, if 47.2 as 48, if 60.8 as 60, if -13.5 as -14, if -13.0 as -14, etc.

10. Below zero temperatures and dew points will be indicated in the usual manner, i. e., by use of the same code with the value being subtracted from 100. There is practically no opportunity of confusing values under this system as they occur in all localities in this country at different periods of the year. Thus, "SOUSING" in winter would indicate a temperature of 12 below zero and a dew point of 14 below zero.

11. WIND:- The direction and velocity of the surface wind will be determined in accordance with paragraph 8 of Form 1133-Aer., August 1, 1934, and will be coded by use of the regular barometer/temperature code words on pages 20-27, inclusive, of the 1931 Weather Code, using

"BA"	words for north
"BI"	" north northeast
"DA"	" northeast
"DI"	" east northeast
"FA"	" east
"FI"	" east southeast
"GA"	" southeast
"GI"	" south southeast
"MA"	" south
"MI"	" south southwest
"NA"	" southwest
"NI"	" west southwest
"RA"	" west
"RI"	" west northwest
"SA"	" northwest
"SI"	" north northwest

12. The character of the wind, i. e., fresh, strong or severe gusts, variable, etc., will be indicated in English immediately following the code word for direction and velocity, when appropriate, in accordance with the terms and instructions given in Paragraph 8 of Form 1133-Aer., August 1, 1934. For example, "BANGING SEVERE GUSTS" would indicate a wind from the north, velocity 46 miles per hour, severe gusts occurring. For velocities of 100 miles, use the words for zero or 100-degree temperature, e. g., "SAY" would indicate a 100-mile velocity from the northwest. For velocities over 100 miles an hour, the word "ONE" will be inserted before the code word, e. g., "ONE SAVIOR" would indicate a velocity of 106 miles an hour from the northwest. Calm will be indicated by sending the word "CALM". Only even velocities will be coded, the next lower even figure being used when the value of the velocity is odd.

13. BAROMETRIC PRESSURE:- The sea level barometric pressure will be reported by use of the code words for zero or 100-degree temperatures taken from the regular barometer/temperature code on pages 19-28 of the 1931 Weather Code, only the hundredths being enciphered. Thus, "BULK" would indicate a pressure of 29.10, 30.10 or 31.10; "DEBT", 29.24, 30.24, etc.

14. REMARKS:- These will be reported in English when appropriate immediately following the barometric pressure code word, in accordance with the terms and instructions given in Paragraph 11 of Form 1133-Aer., August 1, 1934, except that the height of lower scattered clouds will be indicated as outlined in Paragraph 23(f) herein.

15. PRESSURE CHANGE AND CHARACTERISTIC (including 5000-foot pressure at designated stations):- These data will be entered immediately following the "Remarks", or the "Barometric Pressure" if no remarks are present.

16. Certain selected stations in the Western Plateau and Mountain Region will transmit "pressures reduced to the 5000-foot plane" in their 4-hourly airways weather reports, enciphering these data in conjunction with the pressure change data. The Weather Bureau Airport Station, Oakland, Calif., has been designated to carry out the 5000-foot pressure project. Stations which are not selected to transmit "5000-foot pressures" will merely transmit the pressure change data while stations selected for this purpose will transmit both the pressure change data and the "5000-foot pressures." The latter stations will be notified regarding their selection by correspondence, wherein the necessary instructions for reducing the pressures to the 5000-foot plane will also be given.

17. The system of coding the data is somewhat different at stations having a barograph from that at stations where this instrument is not available. Stations will be governed therefore in accordance with the following:

(a) Station has a barograph.

The station pressure change and pressure characteristic will be enciphered in accordance with instructions given in paragraphs 33

to 39, incl., of the 1931 Weather Code, using the Code words given on pages 37 to 46 of the same code. Stations not transmitting the "5000-foot pressure" will use the appropriate code words for 100 to 0 degrees, while stations transmitting the "5000-foot pressure" will encipher this datum (hundredths only, omitting whole inches) by the code words, corresponding to a maximum (or minimum) temperature numerically equal to the "5000-foot pressure" (hundredths only).

Examples:

(1) Station which does not transmit "5000-foot pressure."

"Debt" signifies "Barometer unsteady, but 0.03 or 0.04 inch higher than three hours previous."

(2) Station which does transmit "5000-foot pressure."

"Deserve" signifies "Barometer unsteady but 0.03 or 0.04 inch higher than three hours previous; pressure at 5000-foot plane 24.84 inches."

(b) Station has no barograph.

The net 3-hourly station pressure change and the direction of the change will be indicated by selecting either an "F" (for rising pressure) or an "S" (for falling pressure) word from pages 40 or 45 of the 1931 Weather Code. Stations not transmitting the "5000-foot pressure" will use the appropriate code words for 100 or 0 degrees, while stations transmitting the "5000-foot pressure" will encipher this datum by using the "F" or "S" code words corresponding to a maximum (or minimum) temperature numerically equal to the 5000-foot pressure (hundredths only, omitting whole inches.)

Examples:

(1) Station does not transmit "5000-foot pressure."

"Fish" signifies "Barometer rose net amount of 0.05 or 0.06 inch during previous three hours."

(2) Station does transmit "5000-foot pressure."

"Finance" signifies "Barometer rose net amount of 0.05 or 0.06 inch during previous three hours; pressure at 5000-foot plane 24.62 inches."

18. If the 3-hourly pressure change is 0.10 inch or more, it will be enciphered as "0.07 or more", but an appropriate "K" word will be added as the next word to indicate the total change. "K" words appear on page 47 of the 1931 Weather Code (see paragraph 39 and following example, 1931 Weather Code).

19. Stations which do not make hourly observations but do make 4-hourly observations and have no barograph will compute the net 3-hourly pressure change as $\frac{3}{4}$ of the change between the previous 4-hourly station pressure and the current station pressure.

20. When reports are to be relayed from the telegraph to the teletype or radio, the code words in question must be converted to the proper numerical and letter code described in Section IV.

21. CLOUDS:- The amount, type and direction of any clouds present will be reported in code immediately following the pressure change word. Opportunity is taken here to stress the importance of accurate cloud observations in forecasting work, recent indications being that those have not always been as accurate as might be, particularly those taken at night. Such observations themselves should and are intended to represent an instantaneous view of the distribution of cloudiness over the sky at the moment of observation, i. e., the observer will report the amounts and types (as outlined below) of cloudiness actually visible as projected against the plane of the sky, the amounts to be determined by independent estimates of the amounts of cloudiness and the amounts of blue or open sky, when appropriate.

22. The total amount of clouds reported in any one observation shall not exceed ten-tenths.

23. The following will govern the use of the code words:

(a) Not more than three code words will be used in any one report; not more than one being for clouds above 10,000 feet altitude and not more than two being for clouds below that altitude. The "G" words from the 1931 Weather Code will be used, but as it is important that the odd-tenths of sky covered be enciphered, the letter "s" or the suffixes "es" or "ies", as required, will be added to the code words to indicate this, except those for amounts of one-tenth or less. For instance, the code words for cirrus or cirrostratus from the northwest would read as follows under this system:

CURTSY	one-tenth	CURSERS	five-tenths
CUPSAIL	two-tenths	CURSING	six-tenths
CUPSAILS	three-tenths	CURSINGS	seven-tenths
CURSER	four-tenths	CURSORY	eight-tenths
	CURSORIES	nine and ten-tenths	

(b) One word only will be used to report the clouds above 10,000 feet altitude. These clouds will consist of the cirrus, cirrostratus and cirro-cumulus types and occasionally intermediate clouds of the alto-stratus or alto-cumulus types. The predominating type only will be enciphered when more than one type is present, but the amount indicated

will be the sum of the amounts of sky covered by the various types and the direction given will be that of the predominant type present.

(c) In reporting lower clouds, i. e., those below 10,000 feet, the level or stratum will be regarded as the unit to be reported rather than indication of each of the various types present. Therefore, if only one stratum (by stratum is meant a layer of clouds at the same altitude) of lower clouds covering over 1/10 of the sky are present, one code word will be used to encipher them, the code word to indicate the predominant type in the stratum. If two strata are present, each covering over 1/10 of the sky, two code words are to be used, the predominating type in each stratum to be enciphered, except that in case both strata are of the same type of clouds only one code word will be used, the amount given being the sum of the two strata and the direction that of the strata covering the most sky. In the event that amounts are equal, the direction given will be that of the lower layer.

(d) If clouds above 10,000 feet are present and clouds below that height are also present, the lower strata will be reported as prescribed in "c" above and the upper clouds as prescribed in "b", making sure that the total of lower and upper clouds enciphered does not exceed ten-tenths.

(e) If more than two levels or strata of clouds are present below 10,000 feet, each covering over 1/10 of the sky, the lower stratum and the predominant stratum will be enciphered. If these are the same, the next higher stratum will also be coded.

(f) Since the forecaster does not have any information as to the height of the lower stratum of clouds present unless these constitute a ceiling covering 6/10 or more of the sky, the altitude of the lowest layer of clouds enciphered in a code word will be indicated by insertion of the proper term from the following table immediately preceding the cloud code word referred to, providing that this code word is for less than 6/10 of sky covering:

ONE	from the surface to 500 feet above the surface.
TWO	from 501 feet to 1000 feet
THREE	from 1001 to 2000 feet
FOUR	from 2001 to 3000 feet

For example: CURRENCY ONE CHAINSAWS would indicate 4/10 cirrus and 3/10 stratus present, the latter being at an altitude between the surface and 2001 to 3000 feet.

(g) The words enciphered for the various levels shall be put in the same order as provided in the 1931 Weather Code, i. e., the highest clouds first and then following in the order of altitude with the lower-most last.

(h) When the motion of any clouds enciphered is unusually rapid, the word "Rapid" shall be inserted immediately following the code word to which it refers.

(i) The following code words will be used for "calm" and "unknown".

Cloud Type		1 10 or less	2 or 3 tenths	4 or 5 tenths	6 or 7 tenths	8, 9 or 10 tenths
Ci or Ci St	Cull	Curvaly	Curley	Cupid	Cukoo	Cuckoo
Ci Cu or A Cu	Catch	Galvar	Cake	Calking	Carrillow	Carrillow
A St.	Cent	Cellar	Celeste	Ceiling	Cesspool	Cesspool
Cu	Circum	Cicala	Cicero	Cilium	Cinco	Cinco
St Cu	Cocky	Collar	Copper	Coppice	Cogito	Cogito
St	Chilly	Choppagel	Chopper	Chocking	Cezor	Cezor
Nb or Cu Nb	Clanky	Clovake	Clapper	Creaking	Ceziz	Ceziz
UNKNOWN						
Ci or Ci St	Cuzzzy	Cuzold	Cuzel	Cuzilt	Cuzilt	Cuzilt
Ci Cu or A Cu	Cazy	Calzann	Cazell	Cazif	Cazif	Cazif
A St.	Cezule	Cezayee	Cezery	Cezist	Cezist	Cezist
Cu	Cirzule	Cizahn	Cilzer	Cipzil	Cipzil	Cipzil
St Cu	Cozup	Cozate	Cozener	Cozine	Cozine	Cozine
St	Chozy	Chizarn	Chazol	Chezipe	Chezop	Chezop
Nb or Cu Nb	Clazule	Clazart	Crazed	Clezir	Crazol	Crazol

24. Mammato-cumulus or alto-cumulus-castellatus clouds will not be reported separately, but will be coded as strato-cumulus and alto-cumulus, respectively, when observed.

25. THUNDERSTORMS:- Thunderstorms occurring at the station or in the distance at the time of observation will of course be reported under "Weather" or "Remarks" as provided in Paragraph 4 of Form 1133-Aer., August 1, 1934. However, it is important to the forecaster receiving the reports to have information concerning storms which may have been observed in the interval between reports from a particular station. It is especially important that he have information as to the last occurrence of a storm or storms and the direction from the station in which this was last observed, i. e., if the last storm observed in the period between the observations occurred two hours ago and was last observed in the northeast, this information would indicate that the condition causing the storms had disappeared as regards that particular station. Therefore, the last storm observed and its direction from the station will be reported in code words built up in accordance with the following, provided no storm is reported under "Weather" or "Remarks" in the current observation.

(a) The first two letters will be "TH".

(b) Following this will be a vowel selected from the following list. This will indicate the number of hours to the nearest hour preceding the current observation that a thunderstorm(s) was (were) last observed from the station:

A	-	first hour preceding current observation.
E	-	second hour "
I	-	third hour "
O	-	fourth hour "

(c) Following the time letter the abbreviations for one of the four cardinal directions, i. e., north, east, south and west, will be entered. This will indicate the direction from the station in which the last storm(s) visible from the station was (were) observed.

For example, under the foregoing system "THAN" would indicate that the last thunderstorm visible from the station was last observed in the hour preceding the current observation in a direction north of the station; "THIS" would indicate that the last storm was last observed from the station in the third hour preceding the present observation south of the station, etc.

NOTE:- Code words as prescribed above will not be sent if a thunderstorm is reported in the current observation, under "Weather" or "Remarks".

26. DEPTH OF SNOW:- This will be reported from stations forwarding reports by telegraph or as a special message by radio at 8 a. m., E. S. T., by use of the "Depth of Snow" words taken from the list given on page 72 of the 1931 Weather Code.

27. EXAMPLES OF REPORTS:- The letters in the first column refer to the same letters and elements under Paragraph 5.

(A). (8 a. m. obs.) Station has barograph and reports 5000-foot pressure.

Words entered.	Translation.
(a). UNLIMITED-----	ceiling unlimited.
(b). CLEAR-----	sky clear.
(c). THREE-----	visibility 3 miles.
(d). -----	weather omitted, none to report.
(e). BLOWING SNOW-----	obstructions to vision.
(f). BACILLUS-----	temperature 12, dew point 6.
(g). BANGER SEVERE GUSTS-----	wind north, 44 miles per hour, severe gusts.
(h). FULL-----	barometer 30.30.
(i). -----	remarks omitted, none to report.
(j). FINANCE-----	pressure change. Barometer steady or rising, rose net amount of 0.05 or 0.06 inch during previous 3 hours; pressure at 5000-foot plane 24.62.
(k). -----	no clouds.
(l). -----	no thunderstorms.
(m). YULGUF-----	4 inches snow on ground.

Body of message sent:

UNLIMITED CLEAR THREE BLOWING SNOW BACILLUS BANGER SEVERE GUSTS
FULL FINANCE YULGUF.

(B). (4 a. m. obs.) Station has no barograph and does not report 5000-foot pressure.

Words entered.	Translation.
(a). THREE THOUSAND-----	ceiling 3000 feet.
(b). BROKEN-----	sky condition, broken clouds.
(c). FOUR-----	visibility 4 miles.
(d). LIGHT RAIN-----	weather condition.
(e). HAZY-----	obstructions to vision.
(f). RUNNING-----	temperature 70, dew point 66
(g). RIBBED-----	wind west northwest, $1\frac{1}{4}$ miles per hour.
(h). US-----	barometer, 30.00
(i). DARK IN WEST-----	remarks.
(j). SING-----	pressure change, 0.05 to 0.06 inch lower than 3 hours previous.
(k). COGNIZANT-----	6/10 strat-cumulus, southwest
. TWO CHINAS-----	3/10 stratus, southwest, between 500 and 1000 feet.

Words entered.	Translation.
(1). THAN-----	thunderstorm last observed during 1st hour preceding this observation, north of station.
(m). -----	no snow.

Body of message sent:

THREE THOUSAND BROKEN FOUR LIGHT RAIN HAZY RUNNING RIBBED US DARK IN WEST SING COGNIZANT TWO CHINAS THAN.

(C). (noon observation) Station has barograph but does not report 5000-foot pressure.

Words entered.	Translation.
(a). FIFTEEN HUNDRED-----	ceiling 1500 feet.
(b). HIGH SCATTERED LOWER BROKEN-----	sky condition, high scattered, lower broken clouds.
(c). EIGHT-----	visibility 8 miles.
(d). -----	weather omitted, none to report.
(e). -----	obstructions to vision omitted, conditions absent.
(f). SEROTINE-----	temperature 84, dew point 78
(g). GILBY-----	wind south southeast 10 miles per hour.
(h). TOLD-----	barometer, 29.95
(i). SHOWERS VISIBLE WEST-----	remarks
(j). SEEK-----	pressure change, barometer falling, 0.03 to 0.04 inch lower than 3 hours previous.
(k). CARAMEL-----	2/10 alto-cumulus, west
CONTRITE-----	6/10 strato-cumulus, west.
(l). THOE-----	Thunderstorm last observed east of station fourth hour preceding present observation.
(m). -----	no snow.

Body of message sent:

FIFTEEN HUNDRED HIGH SCATTERED LOWER BROKEN EIGHT SEROTINE GILBY TOLD SHOWERS VISIBLE WEST SEEK CARAMEL CONTRITE THOE.

(i) The following code words will be used for "calm" and "unknown":

CALM

Cloud Type	1 to 10 or less	2 or 3 tenths	4 or 5 tenths	6 or 7 tenths	8, 9 or 10 tenths
Ci or Ci St	Cull	Curval	Curley	Cupid	
Ci Cu or A Cu	Catch	Calvar	Cake	Calking	
A St.	Cent	Cellar	Celeste	Ceiling	
Cu	Circum	Cicala	Cicero	Cilium	
St Cu	Cocky	Collar	Copper	Coppice	
St	Chilly	Choppage	Chopper	Choking	
Nb or Cu Nb	Clanky	Cloves	Clapper	Creaking	
				UNKNOWN	
Ci or Ci St	Cuzzy	Cuzel	Cuzilt	Cuzilt	
Ci Cu or A Cu	Cazy	Cazell	Cazif	Cazif	
A St.	Cezule	Cezay	Cezist	Cezist	
Cu	Cirzule	Cizahn	Cilzer	Cipzil	
St Cu	Cozup	Cozate	Cozener	Cozine	
St	Chozy	(Chizer)	Chazol	Chezipe	
Nb or Cu Nb	Clazule	Clazart	Crazed	Clezir	

For example: OBSERVERS ONE CHAINMAN WORDS means that if 10 or more words are present in the list, the first two words will be used.

24. Mammato-cumulus or alto-cumulus-castellatus clouds will not be reported separately, but will be coded as strato-cumulus and alto-cumulus, respectively, when observed.

25. THUNDERSTORMS:- Thunderstorms occurring at the station or in the distance at the time of observation will of course be reported under "Weather" or "Remarks" as provided in Paragraph 4 of Form 1133-Aer., August 1, 1934. However, it is important to the forecaster receiving the reports to have information concerning storms which may have been observed in the interval between reports from a particular station. It is especially important that he have information as to the last occurrence of a storm or storms and the direction from the station in which this was last observed, i. e., if the last storm observed in the period between the observations occurred two hours ago and was last observed in the northeast, this information would indicate that the condition causing the storms had disappeared as regards that particular station. Therefore, the last storm observed and its direction from the station will be reported in code words built up in accordance with the following, provided no storm is reported under "Weather" or "Remarks" in the current observation.

(a) The first two letters will be "TH".

(b) Following this will be a vowel selected from the following list. This will indicate the number of hours to the nearest hour preceding the current observation that a thunderstorm(s) was (were) last observed from the station:

A - first hour preceding current observation.

E - second hour " " "

I - third hour " " "

O - fourth hour " " "

(c) Following the time letter the abbreviations for one of the four cardinal directions, i. e., north, east, south and west, will be entered. This will indicate the direction from the station in which the last storm(s) visible from the station was (were) observed.

For example, under the foregoing system "THAN" would indicate that the last thunderstorm visible from the station was last observed in the hour preceding the current observation in a direction north of the station; "THIS" would indicate that the last storm was last observed from the station in the third hour preceding the present observation south of the station, etc.

NOTE:- Code words as prescribed above will not be sent if a thunderstorm is reported in the current observation, under "Weather" or "Remarks".

26. DEPTH OF SNOW:- This will be reported from stations forwarding reports by telegraph or as a special message by radio at 8 a. m., E. S. T., by use of the "Depth of Snow" words taken from the list given on page 72 of the 1931 Weather Code.

27. EXAMPLES OF REPORTS:- The letters in the first column refer to the same letters and elements under Paragraph 5.

(A). (8 a. m. obs.) Station has barograph and reports 5000-foot pressure.

Words entered.	Translation.
(a). UNLIMITED-----	ceiling unlimited.
(b). CLEAR-----	sky clear.
(c). THREE-----	visibility 3 miles.
(d). -----	weather omitted, none to report.
(e). BLOWING SNOW-----	obstructions to vision.
(f). BACILLUS-----	temperature 12, dew point 6.
(g). BANGER SEVERE GUSTS-----	wind north, 44 miles per hour, severe gusts.
(h). FULL-----	barometer 30.30.
(i). -----	remarks omitted, none to report.
(j). FINANCE-----	pressure change. Barometer steady or rising, rose net amount of 0.05 or 0.06 inch during previous 3 hours; pressure at 5000-foot plane 24.62.
(k). -----	no clouds.
(l). -----	no thunderstorms.
(m). YULGUF-----	4 inches snow on ground.

Body of message sent:

UNLIMITED CLEAR THREE BLOWING SNOW BACILLUS BANGER SEVERE GUSTS
FULL FINANCE YULGUF.

(B). (4 a. m. obs.) Station has no barograph and does not report 5000-foot pressure.

Words entered.	Translation.
(a). THREE THOUSAND-----	ceiling 3000 feet.
(b). BROKEN-----	sky condition, broken clouds.
(c). FOUR-----	visibility 4 miles.
(d). LIGHT RAIN-----	weather condition.
(e). HAZY-----	obstructions to vision.
(f). RUNNING-----	temperature 70, dew point 66
(g). RIBBED-----	wind west northwest, 14 miles per hour.
(h). US-----	barometer, 30.00
(i). DARK IN WEST-----	remarks.
(j). SING-----	pressure change, 0.05 to 0.06 inch lower than 3 hours previous.
(k). COGNIZANT-----	6/10 strat-cumulus, southwest
TWO CHINAS-----	3/10 stratus, southwest, between 500 and 1000 feet.

Words entered.	Translation.
(1). THAN-----	thunderstorm last observed during 1st hour preceding this observation, north of station.
(m). -----	no snow.

Body of message sent:

THREE THOUSAND BROKEN FOUR LIGHT RAIN HAZY RUNNING RIBBED US DARK IN WEST SING COGNIZANT TWO CHINAS THAN.

(C). (noon observation) Station has barograph but does not report 5000-foot pressure.

Words entered.	Translation.
(a). FIFTEEN HUNDRED-----	ceiling 1500 feet.
(b). HIGH SCATTERED LOWER BROKEN-----	sky condition, high scattered, lower broken clouds.
(c). EIGHT-----	visibility 8 miles.
(d). -----	weather omitted, none to report.
(e). -----	obstructions to vision omitted, conditions absent.
(f). SEROTINE-----	temperature 84, dew point 78
(g). GILBY-----	wind south southeast 10 miles per hour.
(h). TOLD-----	barometer, 29.98
(i). SHOWERS VISIBLE WEST-----	remarks
(j). SEEK-----	pressure change, barometer falling, 0.03 to 0.04 inch lower than 3 hours previous.
(k). CARAMEL-----	2/10 alto-cumulus, west
CONTRITE-----	6/10 strato-cumulus, west.
(l). THOE-----	Thunderstorm last observed east of station fourth hour preceding present observation.
(m). -----	no snow.

Body of message sent:

FIFTEEN HUNDRED HIGH SCATTERED LOWER BROKEN EIGHT SEROTINE GILBY TOLD SHOWERS VISIBLE WEST SEEK CARAMEL CONTRITE THOE.

SECTION IV

Instructions for Adding Special Data to Radio and Teletype Sequence Reports

28. All Weather Bureau first-order and airport stations making regular reports by radio or teletype will add to the reports nearest the even hours of 4 and 8 a. m. and p. m., 12 noon and 12 midnight, E. S. T., daily, pressure change, cloud and thunderstorm data.

29. Intermediate stations manned by Weather Bureau airways observers or Department of Commerce Radio Operators or Airways Keepers making regular reports by radio or teletype will add pressure change and thunderstorm data in all cases. Cloud data will be added by these stations only as specifically directed to do so by the general supervising station for the airway. Forecast centers desiring this information from stations not under their general supervision may arrange with the regional supervising station concerned to have this done.

30. The data shall be added in the following order:-

1. Pressure Change.
2. Clouds.
3. Thunderstorms.

31. PRESSURE CHANGE AND CHARACTERISTIC (including 5000-foot pressure at selected stations):- See Paragraph 16 relative to the selection of stations for including the 5000-foot pressure.

32. The data will be obtained and added to the reports in accordance with the following:-

(a) Station has a barograph.

The net change in the station pressure for the three hours immediately preceding the observation will be indicated by figures representing the proper number of hundredths of an inch.

Following this without a space will be a letter taken from the following list (formed of initial letters of the 1931 Weather Code for pressure characteristic, pp. 5, 37-46) indicating the pressure characteristic:

(A)¢	Rising, then falling)	Barometer same or higher
(B)	Rising, then steady)	than 3 hours previous
(D)	Unsteady, rising)	to observation.
(F)	Steady, or steadily rising)	
(G)	Falling, or steady, then rising)	

(M) Falling, then rising) Barometer lower than
(N) Falling, then steady) 3 hours previous to
(R) Unsteady, falling) observation.
(S) Steadily falling).).
(T) Steady, or rising, then falling)

(A) The characteristic "rising, then falling" is indicated by the absence of a consonant, the letter (A) to be used in those cases.

If no net change occurs, the figure naught (zero) will be sent followed by the proper characteristic letter.

If a station in the Western Plateau Region has been selected to transmit the "pressure reduced to the 5000-foot plane", this pressure will be indicated by two numbers representing the hundredths of an inch in the "5000-foot pressure" (whole inches omitted) immediately following the characteristic letter without space or oblique.

Examples:

(1) Station which does not transmit "5000-foot pressure."

"7R" signifies "Barometer unsteady, 0.07 inch lower than 3 hours previously."

(2) Station which does transmit "5000-foot pressure."

"10S79" signifies "Barometer steadily falling, 0.10 inch lower than 3 hours previous; pressure at 5000-foot plane 24.79 inches."

(b) Station has no barograph.

The net station pressure change for the three hours preceding the observation will be given in figures representing the proper number of hundredths of an inch.

Immediately following this will be given a plus (+) or minus (-) sign to indicate the direction of the pressure change. Zero change will be indicated by the word "none" where the station does not transmit the "5000-foot pressure." If the station does transmit the "5000-foot pressure", zero change will be indicated by a naught (zero) followed by an oblique.

If the "5000-foot pressure" is to be transmitted, the hundredths of an inch (omitting whole inches) in this pressure will be indicated following the (+) or (-) sign (or oblique if the change is zero) without a space between them.

Examples:

(1) Station which does not transmit "5000-foot pressure."

"4+" indicates "Barometer rose net amount of 0.04 inch in the last three hours."

(2) Station which does transmit "5000-foot pressure."

"8-88" signifies "Barometer fell net amount of 0.08 inch in the last three hours; pressure at 5000-foot plane 24.88 inches." "0/06" signifies "Net change in barometer zero; pressure at 5000-foot plane 25.06 inches."

33. CLOUDS:- The amount, type and direction of any clouds present will be reported by stations directed to do so immediately following the pressure change data. These data are intended to represent an instantaneous view of the distribution of various types of clouds over the sky at the moment of observation, i. e., the observer will report the amounts and types of cloudiness actually visible as projected against the plane of the sky, the amounts to be determined by the estimation to tenths of the amount of the whole sky covered by each type.

34. The total amount of clouds reported in any one observation shall not exceed ten tenths.

35. One cloud group only will be used to report clouds above 10,000 feet above the station. These clouds will consist of the cirrus, cirro-stratus and cirro-cumulus types and occasionally clouds of the alto-stratus or alto-cumulus types. Only the predominating type will be reported when more than one type is present, but the amount indicated will be the sum of the amounts of the sky covered by all high types and the direction given will be that of the predominant type present.

36. In reporting lower clouds, i. e., those below 10,000 feet, the level or stratum will be regarded as the unit to be reported rather than indication of each of the various types present. Therefore:-

(a). If only one stratum of clouds below this level are present one group will be used to report them.

(b). If two strata are present, two groups will be sent, except that in case both strata are composed of the same type of clouds only one group will be sent, the amount given being the sum of the two strata and the direction that of the stratum covering the most sky. In the event that the amounts are equal, the direction given will be that of the lower layer.

37. If clouds above 10,000 feet are present and clouds below this level are also present, the lower strata will be reported as prescribed in paragraph 36 and the upper strata as prescribed in paragraph 35.

38. If more than two levels or strata of clouds are present below 10,000 feet, the lowest stratum and the predominant stratum will be reported. If these are the same, the next higher stratum will be reported.

39. The groups will be placed in the order of the altitude of the clouds reported, the highest being reported first and the lower-most last.

40. The following rules concerning transmission will apply:-

(a). The number of tenths of the sky covered by the stratum of clouds in question will be indicated by the proper figure. In the event the amount is less than one-tenth, i. e., a few, this will be indicated by the use of the letter "F" in place of the amount, this to be separated from the cloud type symbol by an oblique.

(b). The type (or predominant type in a stratum) of clouds will be indicated by the following symbols:-

CI	Cirrus	STCU	Strato-cumulus
CIST	Cirro-stratus	MCU	Mammato-cumulus
CICU	Cirro-cumulus	CU	Cumulus
AST	Alto-stratus	NB	Nimbus
ACU	Alto-cumulus	ST	Stratus
ACC	Alto-cumulus-castellatus	CUNB	Cumulo-nimbus
		FRST	Fracto-stratus

(c). The direction from which the clouds are moving will be indicated by the regular direction abbreviation in radio transmissions or by the direction arrows if transmitted by teletype, separated from the cloud type by an oblique in the first case.

(d). Where the direction is not known, or cannot be determined, the letter "U" will be used in place of the direction. If the clouds are not moving; i. e., they are calm, this will be indicated by using the letter "Z" in place of the direction. In either case an oblique will be used to separate these from the cloud abbreviation.

(e). If the clouds reported in any group are observed to be moving unusually rapidly, the letter "R" will be added immediately following the direction.

(f). The directions will be given to sixteen points.

41. For example, "8CIST/N" or "8CIST↑" would indicate 8/10 of the sky covered by cirro-stratus moving from the north; "3STCU/SSE" or "3STCU↑↖" would indicate 3/10 of the sky covered with strato-cumulus moving from the south southeast; "F/ACC/Z" would indicate a few alto-cumulus-castellatus present and these are calm, etc.

42. THUNDERSTORMS:- All stations making regular sequence reports by radio or teletype, including those manned by Department of Commerce personnel, will add data concerning thunderstorms observed at the station during the 4-hour period immediately preceding the observations nearest 4 and 8 a. m. and p. m. and 12 noon and 12 midnight, E. S. T., in accordance with the following, except when a thunderstorm(s) is (are) reported under "Weather" or "Remarks" in the current report:-

(a). The letter "T" will be used to indicate "thunderstorm".

(b). Immediately following this will be entered a figure 1, 2, 3, or 4, indicating the hour in which a thunderstorm(s) was (were) last observed, "1" applying to the first hour preceding the present report, "2" to the second hour, etc.

(c). Following this without space or oblique will be entered the proper English direction abbreviation, to four directions only, for the direction from the station in which the storm(s) was (were) last observed.

43. For example, under the foregoing system "T3N" would indicate that a thunderstorm(s) was (were) last observed in the third hour preceding the current observation in a direction to the north of the station; "T1E" would indicate a thunderstorm(s) was (were) last observed in the first hour preceding the current observation in a direction east of the station, etc.

44. All the information required under the foregoing can be obtained at hourly reporting stations by inspection by the observer of the data entered on Forms 1130-Aer. for the four hours preceding the current observation.

W. R. Gregg,
Chief of Bureau.